



Participatory Design Research and Educational Justice: Studying Learning and Relations Within Social Change Making

Megan Bang & Shirin Vossoughi

To cite this article: Megan Bang & Shirin Vossoughi (2016) Participatory Design Research and Educational Justice: Studying Learning and Relations Within Social Change Making, *Cognition and Instruction*, 34:3, 173-193, DOI: [10.1080/07370008.2016.1181879](https://doi.org/10.1080/07370008.2016.1181879)

To link to this article: <http://dx.doi.org/10.1080/07370008.2016.1181879>



Published online: 31 May 2016.



Submit your article to this journal [↗](#)



Article views: 231



View related articles [↗](#)



View Crossmark data [↗](#)

GUEST INTRODUCTION

Participatory Design Research and Educational Justice: Studying Learning and Relations Within Social Change Making

Megan Bang^a and Shirin Vossoughi^b

^aLearning Sciences and Human Development, University of Washington, Seattle, Washington, USA; ^bLearning Sciences, Northwestern University, Evanston, Illinois, USA

This special issue brings together a set of articles by scholars working to expand equitable forms of learning and teaching that contribute to a socially just democracy—or what we might call “social change making” projects—and to advance fundamental knowledge of learning and development. Many scholars have charted and enacted innovative forms of theory, method, and praxis to extend the possibilities of productively disrupting historically powered relations as part of working towards equity and forms of just democracies. Often these efforts are focused on developing effective interventions that cultivate transformative agency among historically marginalized individuals and communities toward specific and consequential ends. To accomplish these goals, increasingly scholars are focused on the development of theories of learning that account for critical historicity, power, and relationality. This special issue aims to contribute to this scholarship by drawing attention to growing engagements in the field of education with a method that we are calling participatory design research (PDR). The works featured in this special issue are primarily from early career scholars, some in collaboration with more senior scholars, who explore the ways in which PDR is beginning to shape a newer generation of research epistemologies. These epistemologies may be essential for expanding our fundamental knowledge of learning as well as developing theory that can help create sustainable and transformative social change. Our introduction aims to chart some of the emergent contributions and future directions we think PDR may afford.

PDR: Scopes of possibility

Similar to design-based research (DBR), PDR emerges from and reflects different traditions and sensibilities (Bell, 2004), especially design research (Brown, 1992; Cobb, Confrey, diSessa, Lehrer, & Schauble, 2003; Sandoval & Bell, 2004), design-based implementation research (Penuel, Fishman, Cheng, & Sabelli, 2011; Penuel, Coburn, & Gallagher, 2013), formative interventions (Engeström, 2011; Engeström, Sannino, & Virkkunen, 2014; Sannino, 2015), social design experiments (Gutiérrez, 2008; Gutiérrez & Vossoughi, 2010), researcher–practitioner partnerships (Coburn, Penuel, & Geil, 2013), and community-based design experiments (Bang, Medin, Washinawatok, & Chapman, 2010; Bang, Faber, Gurneau, Marin, & Soto, 2015). There is also a historical resonance with other forms of critical and participatory research, such as participatory action research (Fine et al., 2003; Whyte, 1991), collaborative action research (Erickson, 1994; 2006), youth participatory action research (Cammorata & Fine, 2008; Kirshner, 2010; Mirra, Garcia, & Morrell, 2015), and decolonizing methodologies (Paris & Winn, 2013; Patel, 2015; Smith, 1999; Zavala, 2013). Many of these bodies of work attend to the ways in which normatively powered dynamics are reinscribed in the roles and relations between researchers and “the researched,” and deliberately work to disrupt or create new roles and relations to achieve transformative ends.

The hybridity of theory and method that constitutes PDR may contribute distinct insights to these existing forms of participatory research through its commitment to collaborative design and research practices. In particular, we are concerned with the extent to which PDR attends to the ways in which

CONTACT Megan Bang  mbang3@uw.edu  322 Miller Hall Box 353600, University of Washington Seattle, WA 98195-3600.

This article reflects equal contributions by both authors.

© 2016 Taylor & Francis Group, LLC

(a) critical historicity, (b) power, and (c) relational dynamics shape *processes of partnering* and the possible forms of learning that emerge in and through them. Methodologically PDR links both structural critiques of normative hierarchies of power and imagined possible futures, although like other forms of participatory work, PDR is also committed to consequential impacts in the here and now.

Importantly, PDR maintains a commitment to advancing fundamental insights about human learning and development through explicit attention to what forms of knowledge are generated, how, why, where and by whom. Exemplifying the need for explicit structural critique and alternative visions, developing and documenting more just forms of partnering also requires clear understandings and accounts of how *inequitable* processes of partnering unfold, function, and feel. Efforts to develop more precise articulations of the tensions and problems that emerge in participatory design research (as well as DBR) can therefore enhance our sensitivity to when normative hierarchies may be reproduced in practice. From within a PDR paradigm, the domain of the “researched” in a given project is expanded to include the relational, pedagogical, and design-based activity of researchers themselves (Bang et al., 2010; Vossoughi & Escudé, 2016), creating potentially new openings for reciprocity, accountability, and the de-settling of normative hierarchies of power. Similarly, the domains of “researcher,” “theorist,” and “designer” are intentionally treated as porous categories, open to the questions, concerns, ways of knowing, and designing that are both historically present within communities (Zavala, this issue) and potentially asserted and developed in new ways within PDR projects. These “role re-mediations¹” represent key forms of learning and agency within PDR that are distinct from typical areas of focus in DBR. For example, while there is growing attention to processes of co-design across researchers and practitioners within DBR, there is often less attention to collaborative processes of data analysis and writing and the new roles, relations and practices such collaboration requires. We might also consider how such role re-mediations and processes of partnering are premised on a “designerly” view of settings and the people who create them in and through everyday activity. In this sense, PDR not only seeks to address why partnerships as a method are important, it also stands to contribute broader theoretical insights into the ways design and design decisions are already present within human activity.

Our intent in this issue is not to engage in the kinds of oppositional “fracturing” that routinely occur in academic epistemic activity. Rather we seek to build from previous work, and call for the widening of what counts as relevant dimensions of the empirical to include historical, relational and axiological perspectives and the ways these are embodied and experienced. For example, DBR has illuminated how hosts of decisions made during design processes impact the scopes of possibility in learning environments and activity systems more broadly. However, DBR has tended to maintain, either explicitly or implicitly, normative hierarchically powered decision-making structures and related assumptions of objectivity, paying little attention to the positionality of researchers or their social identities in the unfolding of work. More concretely, design decisions in much of design research are typically made by “experts” who inhabit privileged positions in the world and less often elaborate on efforts to engage in collaborative processes with practitioners, families, youth, or community members. Further, researchers become implicated in preexisting and ongoing debates and tensions within settings in ways that often intersect with social positioning and power, including when an overtly neutral or observational stance is taken. Indeed, claims to objectivity or neutrality often absolve researchers from the need for careful and intentional relationship building and decision making with regard to researchers’ roles and positions.

Given the increasing attention to the ways in which social positioning impacts learning and knowledge construction more broadly (e.g. Holland & Lave, 2001; Holland & Leander, 2004; Lee, 2001; Medin & Bang, 2014; Nasir, Rosebery, Warren, & Lee, 2006; Wortham, 2004; 2006), there is cause for attending more deeply to a range of theoretical lenses (e.g., colonial, racialized, gendered, queered) within our

¹ Our use of this term is grounded in the cultural–historical notion of *re-mediation*, as distinct from *remediation*, which is often organized around a return to basic skills, reductive forms of assistance and ideologies of pathology. As Gutiérrez and Vossoughi (2010, p. 102) write, “Instead of emphasizing basic skills and problems as located in the individual, re-mediation involves a reorganization of the entire ecology for learning and ‘a shift in the way that mediating devices regulate coordination with the environment’ (Cole & Griffin, 1983, p. 70). Development here involves ‘systems reorganization’ in which designing for deep learning requires a ‘social system’s reorganization’ (Cole & Griffin, 1983, p. 73), where multiple forms of mediation are in play.” Similarly, we view role re-mediations within PDR as reflective of systems-level reorganizations, both resulting from and potentially engendering shifts in the activity system.

design methods and processes of partnering (McWilliams, this issue; Vakil, McKinney de Royston, Nasir, & Kirshner, this issue;). Indeed “social design experiments” (Gutiérrez & Vossoughi, 2010), “formative interventions” (Engeström, 2011; Engeström et al., 2014), and community-based design research (Bang et al. 2010; 2015) call attention to just this issue—change is not just about conventional forms of what we typically label learning and practice but is also about transformative social change. In our view, transformative social change involves the interweaving of structural critiques with the enactment of alternative forms of here-and-now activity that open up qualitatively distinct social relations, forms of learning and knowledge development, and contribute to the intellectual thriving and well-being of students, teachers, families, and communities. These co-constituted processes necessitate deeper analysis of theory and method in which the epistemological, ontological, and axiological dimensions of human activity are made explicitly visible and engaged as driving sensibilities in design, enactment, and analysis.

Collectively, the articles in this special issue offer a window into what such analysis looks like. By centering processes of partnering as a primary object of analysis, these articles make visible design practices and forms of relational activity that are typically ignored or erased in educational research. They illuminate dimensions of learning that both embody and help to bring about transformative possibilities by including structural critiques of systems of power as a necessary component within processes of partnering and learning. To clarify what we mean by structural critique, we argue that as claims to and participation in equity work expand, the axiological and ideological underpinnings (Patel, 2016) of equity-seeking research need to become transparently communicated by researchers. The promise and possibility of education contributing to socially just democracies in which a diverse range of cultural communities can thrive, free of assimilative requirements, is and has been rooted in the implicit or explicit axiological assumptions, commitments and hope for some, but not all, educational scholars for generations. While it is now somewhat more common for scholars to reject deficit-based discourses of nondominant peoples as a register for explanation, the multiplicity of forms in which deficit-based discourses manifest and how they are complicit in the reification of normatively powered dynamics and epistemologies is less well articulated. For example, access to “standard” English (as a code of power) may be unproblematically framed as an equity-oriented project, without attending to the lived tensions of cultural and linguistic assimilation and the alternative pathways to multilingual learning and epistemological heterogeneity more broadly.

Further, as issues of equity and diversity have gained rhetorical legitimacy, attendant claims and scholarly efforts have been increasingly organized around political and economic imperatives, such as apprenticing young people into the codes of power and forms of “cultural capital” that are required to enter but not necessarily critique or re-imagine the professional workforce and marketplace. Such efforts tend to leave broader systems and epistemological and ontological assumptions intact, thereby mainstreaming and enclosing the transformative possibilities of both “equity” and “diversity” (Richardson, 2011). In part enclosure happens because there is a tendency to, perhaps implicitly, assume the work of equity means developing more effective designs for assimilating historically underrepresented peoples into normative forms of knowing and disciplinary knowledge as well as participation in related fields. Typically this is done with little regard or outright dismissals of epistemic heterogeneity.

While we do not disagree that mastery of normative forms of knowledge is pragmatically important, we do take issue with equity work that has no view or a deficit view of epistemic heterogeneity as the driving theory of change. Without expansive views, equity work becomes directed toward more effective forms of compliance and participation in inequitable systems and forms of life. More simply, these efforts become singularly focused on increasing nondominant students’ mastery of dominant forms. In our view undertaking equity-oriented work driven by a commitment to epistemic heterogeneity demands theories of change, forms of praxis, and axiological commitments to be more carefully examined, articulated, and theorized as part of scholarship and practice (Smith, 2004). The absence of this rigor increases the risk that the means and ends implied by various equity discourses may in effect repackage and reproduce, rather than fundamentally transform, historical inequities and political structures that substantively shape learning (Booker, Vossoughi, & Hooper, 2014; Martin, 2009; Philip & Azevedo, in press). For example, the United States is founded in settler-colonialism, a form of colonialism that is distinct because settlers come and stay, which sets in motion fundamental desires, disputes, and claims to dominion over

land. The establishment of dominion in the United States was and continues to be predicated on the erasure of Indigenous presence, rights, and ways of knowing, both historically and in the future. While there is much to say about this, what we want to draw out here is the way in which these foundations shape relationships to place through the construction of time–space relations. Thus learning environments, particularly those in which place are central, are always pregnant with decisions about making settler and/or Indigenous peoples present and towards what ends. From this perspective, equity efforts that fail to engage Indigenous presence may indeed reproduce inequities rather than transform them.

The articles in this special issue begin the work of articulating axiological innovations, that is theories, practices, and structures of values, ethics, and aesthetics that shape meaning-making and relations through the processes of partnering and designing learning environments (Bang et al., 2015). In part axiological innovations developed in the context of PDR engage in bidirectional or multidirectional role re-mediation—qualitative shifts in subject–subject relations that emerge within processes of partnering and afford new social and educational possibilities. We argue that these role re-mediations need to be driven by sensibilities that refuse efforts framed by access (either researchers’ access to nondominant communities or nondominant communities’ access to normative learning) and work toward transformative relations and forms of accountability that can unfold in participatory design work. In our view, sustainable forms of equity work that succeed in disrupting normatively powered dynamics account for how the need for such interventions were created (critical historicity), in part because this history is embodied by those participating and present in the fabric of the relations driving the method. In what follows, we substantiate and expand this guiding frame by working to articulate the kinds of theoretical developments that studies of learning attentive to critical historicity, power and relationality demand and may afford. We then draw on the insights developed in the articles to further elucidate three interconnected dimensions that grow from these theoretical and axiological concerns and shape processes of partnering. These include: (a) dynamics of invisibility and critical reflexivity, (b) heterogeneity and transformative agency, and (c) life courses of intervention efforts and sustained (or not) change.

Critical historicity, practicality, and powered relations

An important dimension of PDR is the extent to which the historical genealogies of equity-oriented work, including theoretical developments, social movements, and the evolution of methods, are reflected in researchers’ sensibilities and made explicit in the analysis. We provide two examples from our own work to illustrate the critical importance of this dimension.

First, the Migrant Student Leadership Institute (MSLI), a social design experiment Vossoughi participated in both as an educator and a researcher was a summer program that sought to apprentice high school–aged migrant students in the academic and political tools necessary to enter into and help transform the university (Espinoza, 2009; Gutiérrez, 2008; Vossoughi, 2014). Here, program leaders were grounded in long-term work with migrant communities and routinely made visible to newer participants the multilayered conceptual history the program was both rooted in and contributing to. As Zavala (this issue) writes: “I liken concepts to future-oriented cartographic maps that both represent the geological-historical layering of activity systems but also are tools for transforming their contours and landscapes.” In MSLI, our “cartographic maps” included Freire’s literacy circles, Dewey’s lab school, the sanctuary movement among churches, Civil Rights and de-colonial movements, women of color feminisms, and Vygotskian theorizations—what Tejada (2008) refers to as a theoretical heteroglossia of decolonizing pedagogy. These theoretical and pedagogical antecedents were treated as powerful but imperfect resources, a stance that engendered both reverence and agency among program participants. This included Vossoughi’s sense that her personal history as a child and student of the Iranian Revolution (and third world revolutionary movements more broadly) was positioned as an epistemological resource for wrestling with the tensions and possibilities of political education, alongside and in dynamic conversation with the cultural and political histories of other program designers and participants. In this context, a stance toward design and pedagogy that privileged hybridity (Gutiérrez, Baquedano-López, & Tejada, 1999) and epistemological heterogeneity (Bang, in press) seeded subject–subject relations rooted

in solidarity and opened up new possibilities for pedagogical practice. For example, the forms of political education that developed in this setting often ruptured nationalist frames, as well as some of the conventional practices within critical pedagogy, working to enact forms of epistemic openness that privileged multiple sources of authority and meaning, and treated students' sense-making as valid and full of potential (Talero, 2008; Vossoughi, 2014).

The second example is *Living in Relations*, a 10-year community-based design experiment in which Bang served in a number of ways including as one of several principal investigators (PIs). *Living in Relations* was a series of interventions that were designed, implemented, and studied primarily by community members of two Indigenous communities (one urban, one reservation based). While the primary goals of the projects were to improve learning and wellbeing for Native children, the methodological commitment to have community members lead in the process was driven by the recognition of the historical disenfranchisement and theft of these decisions from Native communities in the United States. Further, because these relational positionings were not born of or from the research, and reflect historically accumulating tensions that Indigenous communities are living (e.g., boarding schools, relocation, land encroachment), Bang's own ongoing contributions within her home Indigenous community shaped what forms of leadership she could appropriately take up. In addition, both hers as well as partners' involvement and knowledge of change making efforts within broader Indigenous communities, educationally and otherwise, were important resources that shaped how the projects unfolded. While these lived histories often formed the foundation of the group's inquiries, this project also engaged a wide range of scholarship to cultivate a theoretical heteroglossia of decolonizing pedagogies (Tejeda, 2008). The range of scholarship taken up both functioned as tremendous resources that guided the work and invited everyone to dig in and articulate realms previously under-considered. For example, the recognition of the ways in which learning environments tend to separate humans from the rest of the natural world, which became recognized as a consequence of settler-colonialism, not only opened up new design decisions that disrupted those forms of normativity but also the very practices of designing which evolved such that designing began happening in places instead of only in buildings. Teachers and designers began walking and designing in the forest preserves or restoration sites where implementation would occur. Importantly, the decolonial stance and practices we developed did not end with the focal projects, but became ways of thinking and doing that rippled into a wide range of community efforts as well as peoples' personal and professional relationships and lives (Bang et al., 2015; Faber, 2016). While there is a life course of projects sometimes tied to funding, the relational positioning and accountability to the broader issues reflected in such work are lived, continually unfolding realities changing the nature of the goals as well as the scope of impacts. In community-based design research, the desired goals are not complete resolution in a single project; rather the expectation is focused on receiving, cultivating and building increased capacity to continue the ongoing work of social change (Bang et al., 2015). This kind of lived dynamic in subject–subject relations in the context of research disrupts notions of beginnings and endings in ways seldom attended to.

These ways of thinking about historicity and its impacts on processes of partnering suggest that attention to researchers' positionalities is not a routine checklist of identity focused on representational diversity. Rather, as Vakil et al. (this issue) argue, attending to the political and theoretical history of the project *as tied to* the personal histories of participants provides crucial insight into the values, goals, processes, and outcomes of learning within the project and partnership itself. Similarly, the absence of attention to researchers' social locations and histories can function in ways that conceal racialized, classed, gendered, colonizing power dynamics, often under the guise of neutrality. McWilliams (this issue) calls out the paucity of queer theory in the field and locates this as an erasure of queer and nonconforming lives that feeds his motivation in gaining acceptance and support for queer scholarship but also for his person. As he asks, "How do we negotiate the very real cultural and local demands that require us to conceal, delay, or ignore aspects of our identities and experiences that might have very real bearing on the force and direction of participatory design?" While McWilliams attends to the ways in which power often asks this of specific identities, if bidirectional role re-mediation is to occur, researchers and partners embodying dominant identities must also work to understand how these identities impact the imagined spaces of learning beyond persistent claims of "objectivity" in design-based research. A routine aspect of design

is contemplating the affordances and constraints of the designed space. Often these affordances and constraints are mobilized as if they are straightforward or fact-like, rather than reflecting perspectives, values, and processes that are already unfolding. Without multidirectional forms of role re-mediation, processes of partnering can therefore obscure key dimensions of the very phenomena that constitute teaching and learning. Drawing instead from Erickson's (1984) notion of "disciplined subjectivity," we are interested in the kinds of systematic inquiry that make substantive contact with the meaning and perspectives of participants as they engage in social change-making, asking after those aspects of history and relationality that matter to those closest to the action.

In our view PDR's expansive possibilities hinge on the extent to which role re-mediations and forms of disciplined subjectivity are enacted during processes of partnering because they impact the scope of affordances and constraints considered. Often affordances and constraints are articulated through discourses of viability or practicality that shape the imagined possibilities for interventions and routinely serve to narrow possible courses of action in change-making projects. In such instances, "practicality" is mobilized in ways that can deflate wider forms of social and pedagogical imagination, tethering the visioning and exploratory work of design to what is practicable given, at minimum, current disciplinary and political-economic structures. Such moves often intersect with (a) the aforementioned mainstreaming of equity, such that historicized, systems-level critiques (of "achievement gap" discourse, for example) become explicitly or implicitly reframed as impractical, and (b) the selective application of "objectivity" within design-based research (as well as many other forms of research), whereby such critiques are framed as overtly "political," allowing normative politics to maintain their position of neutrality and enabling disciplinary normativity to persist. We worry that the expanding field of participatory design research could fall prey to similar dynamics, potentially leaving us well-versed in particular discourses of equity and democracy, but ill-equipped to carefully and continuously attend to the ways our designs and partnerships may reproduce some of the inequities we seek to transform.

However, as reflected in several of the articles, discourses of practicality and viability, when critically examined for their own settled assumptions and values, can serve generative ends. Here, "practicality" can become a dynamic practice within the design of model activity systems (Cole, 2007), actively linking imagined possible futures to consequential forms of change that impact communities in the here and now. In the spirit of prefigurative politics—a set of traditions rooted in social movements that seek to *enact* the type of future they are struggling to bring into being, or, as Yates (2015) describes, to express the political "ends" of their actions through their "means"—this latter form of practicality has the potential to hold space for radical critique and social dreaming (Espinoza, 2008), while inciting the enmeshment of these ideas in current practice. We suggest that these processes emerge in part through reflective discourse about the historicities that shape and give rise to the present as well as what kinds of desired futures projects imagine and work to enact—what we think of as axiological innovations in the design and implementation of learning. More concretely the kinds of injustices and acceptable responses to those injustices, as well as the desired forms of justice that interventions are designed to bring about, will take on new dimensions and theories of change when PDR is enacted in ways that accomplish innovative role re-mediations that disrupt normative forms of imagining and decision making.

Toward axiological innovations: Making relations, imagining equitable futures, and being in the here and now

In our view, the expansion of methods and potential new theoretical contributions marked by PDR emerge in part from its emphasis on studying the co-constitution of subject–subject and subject–object relations. We conceptualize this analytic shift toward subject–subject relations as distinct from—although deeply intertwined with—the subject–object relations that characterize much of learning and development work. Greater attention to subject–subject relations includes naming and analyzing the relational, historical and ethical dimensions of processes of partnering within PDR that, while fundamental to how a project unfolds, may not have figured prominently in prior theorizations or reporting. These dynamics are more than partnerships or relations to be managed—they shape the possible forms of subject–object relations that are imagined, enacted, and disseminated.

We view subject–object relations as a particular lens on human activity, one that foregrounds the relationships between social actors, the immediate goals and larger purposes of their activity, and the range of artifacts that mediate their engagement with a particular object—a key historical move away from behaviorist conceptions of human learning (Vygotsky, 1978). The Learning Sciences has increasingly taken up these ideas within research on learning and teaching; here, the object of activity is often conceived of as some form of disciplinary knowledge or expertise within a given domain (e.g., mathematics, carpentry). Similarly, design-based research tends to focus on increasing the density and quality of learning experiences with respect to desired objects, and identifying effective designs for achievement. While many of these studies also attend to the social or collaborative dimensions of object-oriented activity, we perceive a tendency to highlight relationships between social actors *in so far as* they are consequential to subject–object relations, such as the ways particular forms of classroom discourse or collaboration improve normatively defined academic outcomes. These theoretical and methodological decisions risk constraining the forms of knowledge and practice we develop, enact, and share, and thereby narrow the valued forms of learning and development we study and theorize (Matusov, 1998; McWilliams, this issue). By working to amplify subject–subject relations, we seek to open up a range of insights on learning that only become possible when we attend more deeply to the ways designs for learning and processes of partnering organize for particular kinds of interactions and relationships, as well as the ethics and values embodied in these relationships. In short, we must take seriously the question of “Who does the design and why?” (Engeström, 2011, p. 3), suggesting that perspectives and motivation matter. The “who” and the “why” are also deeply bound up with the *how and where* of design, demanding a focus on process and the genesis of relations as well as the places within which they are made, live, and unfold.

As reflected throughout the special issue, this approach to consequential learning as particularly attentive to subject–subject relations represents a primary focus of study within PDR. Further, conceptualizing learning as both proleptic (Cole, 1996; Gutiérrez, 2008) and prefigurative brings an additional layer of meaning to the call for greater analytic attention to role re-mediations as a key aspect of expanding relationality. Interwoven with the expansion of the object characteristic of transformative agency (e.g., Engeström, 2011; Sannino, 2008) and resonant with Engeström’s conceptualization of collective zones of proximal development (1987; 1996a), close attention to changing subject–subject relations—and the values they embody—offers a way to study the intersection of learning and social change, and we suggest, makes possible simultaneous innovations in both.

We argue that approaching subject–subject and subject–object relations as co-constituted (Packer, 2010) allows us to redefine the object in at least two ways. First, the development and enactment of particular social relations can be conceived of as its own goal or purpose. As Nasir and Hand (2006) suggested, the “content” of learning is thereby expanded to include how people learn to be in relation and the subsequent shifts in individual and collective identity that become possible. Second, we can start to notice the ways narrow objects constrain and discipline subject–subject relations, or conversely, how distinct subject–subject relations might allow for more expansive objects (Engeström & Sannino, 2010). For example: monolingual educational environments that view nondominant language practices from a deficit lens premise pedagogical interactions between students and teachers (subject–subject relations) on assimilation into English, which is implicitly or explicitly defined as a superior cultural tool. In contrast, learning environments that embrace linguistic hybridity and multilingualism can open up distinct subject–subject relations imbued with relational agency (Edwards, 2009). In such cases teachers come to recognize and embrace who students are as well as the range of intellectual resources they bring to learning, and students come to see teachers as caring, engaged adults invested in their well-being (Gutiérrez et al., 1999; Moll, 2010). Importantly, dwelling in subject–subject relations also pushes us beyond a focus on how interactions support conventional forms of achievement toward new epistemological, social, political, and affective possibilities and forms of relational agency (e.g., the potentially new forms of knowledge production, experiences of self or solidarity that become possible in such environments).

We are not suggesting that subject–object relations and subject–subject relations are, or should be, positioned in opposition to one another; nor are we suggesting that there are ideal ways of enacting the relationships that constitute PDR. We are arguing that the privileging of subject–object relations over

and above subject–subject relations may help to account for the ways in which some forms of epistemological hierarchy are reproduced and structural inequities are left intact, even if or when forms of agency are accomplished, at least in activity systems rooted in inequitably powered forms of historicity. The persistent focus and currency invested in disciplinary learning outcomes and linear or vertical learning (Engeström, 1996b; McWilliams, this issue) in many forms of DBR is one such example of the consequences of the focus on subject–object relations that PDR may help to open and expand. Indeed, the broad range of work focused on making visible the relations between nondominant students’ forms of knowledge and practices and disciplinary learning (e.g. Bang & Medin, 2010; Bell, Tzou, Bricker, & Baines, 2012; Gutiérrez, 2008; Gutiérrez et al., 1999; Gutiérrez, Morales, & Martinez, 2009; Heath, 1983, 1989; Lee, 2001, 2008; Martin, 2009; Nasir, 2000, 2002; Rosebery & Warren, 2008; Warren, Ballenger, Ogonowski, Rosebery, & Hudicourt-Barnes, 2001; Warren & Rosebery, 2011 and many others) such that expansive learning environments could emerge evidences this point. Furthermore, these lines of research have opened the possibilities we are exploring here.

Building from these contributions, we suggest there is continued work to do in excavating the ways in which related foci on academic identities may be too narrowly tied to conventional subject–object constructions. If the construction of subject–object relation reflects epistemic heterogeneity and socio-political values (forms of subject–subject relations), new possible realms of intellectual and social identities beyond strict subject–object relations may open. Importantly, our stance also presumes that inequities are not discrete individualized moments in time but rather are reflective of ongoing structural regularities that shape localized forms of activity. There is therefore a need for conceptual and methodological tools that are sensitive to these complexities and can guide the making of relations that embody espoused ideals of equity and justice at broader time scales, and enact “concrete developmental actions” in the here-and-now (Engeström, Engeström, & Kerosou, 2003; Sannino, 2008).

Recently Bang et al. (2015) argued that deeper attention to axiological innovations in designing and studying learning is necessary for broader progress toward just forms of education. Axiological positionings are routine, although often implicit and under-examined, dimensions of interaction and practice that manifest in conceptual ecologies, affective sensibilities, and the development of subject–subject and subject–object relations. Drawing from Lemke (2002), Bang et al. (2015) suggest that axiological innovations must work towards modes of articulation and practice that transform the centers of social gravity (Erickson, 2006) or what seems commonsensical and necessary. Erickson (2006) argued that relationships are always political, meaning they are “power-laden, preconstructed by history, and weighted by social gravity” (p. 237). Erickson also calls attention to the ways in which researchers become part of the practice and come to, when done well, feel the “weight” of social gravity—a shared experience of the structural constraints, everyday pressures, and forms of “wobble room” experienced by participants that can open up analyses that do justice to the complexity and ingenuity of everyday activity. In this sense, then, centers of social gravity are also woven from axiological histories, commitments and imaginings. These manifest in the construction of affordances and constraints during design through discourses of practicality and viability and can be sites of reification and/or innovation with respect to subject–subject and subject–objects relations. Vakil et al. (this issue) argue:

Just as sociocultural theorists acknowledge the ways that human thinking is mediated by cultural and historical tools that precede actors’ arrival on the scene, human relationships are shaped by histories of race and differential power that set the stage for partnership formation. Yet, we also assert that relationships are sites of contestation, constantly negotiated and managed through moment-to-moment interaction and activity.

Further, as reflected in Ehret and Hollet (this issue), relationships are always shaped by the affective flows in moment-to-moment interaction and enable, according to them, placemaking and the development of belonging, which they argue are essential for learning: “Affects always already texture social relations between coparticipants, place, and the production of learning outcomes that continuously (re)constitute the feeling of being in place together.” Historicity also critically informs place-making and belonging. Bang and Marin (2015) argue that the ordering of time–space relations is a routine part of interaction and learning in places. The joint construction of time–space relations in interaction is

imbued with particular memory traces (Giddens, 1984) or perspectives on historicity (even the invisibility or supposed absence is itself a construct) and shapes the ground, or place, of ongoing activity, making the context for learning and imagining possible futures. Thus, axiological innovations in participatory work are necessarily concerned with intervening in presumed neutralities and examining how our values, sensibilities, affects, and desires shape what are “right,” “good,” “important,” or “worthwhile” forms of partnership and work that reflect views of the past, the here-and-now, and imagined futures in the places we dwell.

We posit that there is a three-part challenge to creating and documenting axiological innovations: (1) asking new *how do* questions that reflect critical historicity (e.g., how do specific schooling practices maintain and enact cultural assimilation?) in order to (2) ask different *how can* questions that create new relations and expanded, liberatory forms of activity (e.g., how can learning environments become organized around epistemological heterogeneity?) to (3) ask *how do* questions that characterize and account for learning and development within such innovative activity systems (Cole, 2007) (e.g., if and how do participants in epistemologically heterogeneous environments engage in new subject–subject and subject–object relations?). Within PDR we must first ask: What forms of life are our partnerships and designs reinforcing, powering, validating, and transforming? How do particular places, histories, and moments in time shape what is right or wrong and for whom? These are the kinds of questions taken up in this issue, affording dimensions of *how can* questions that are not routine parts of design-based research. These include a shared concern across the articles with widening who we define as designers, learners and theorists within PDR work, privileging subject–subject relations, and treating the learning processes involved in co-designing for consequential forms of social change as primary objects of analysis. Here, consequentiality is defined as meaningful action that extends across temporal, social, and spatial scales of practice (Hall & Jurow, 2015; Jurow, Teeters, Shea, & Steenis, this issue), including forms of learning that enact changing social and intellectual relations, and that are accountably tied to historical genealogies and possible futures (Gutiérrez, 2013).

The extent to which PDR affords the development of axiological innovations is in our view associated with its potential to help us develop better insights and theories of change that work toward manifesting justice in increasingly effective and sustainable ways. In what follows, we consider how this collection of articles contributes to this project through close attention to three dimensions of processes of partnering: (a) dynamics of invisibility and critical reflexivity, (b) heterogeneity and transformative agency, and (c) life courses of intervention efforts and sustained (or not) change.

Invisibility and critical reflexivity

Broadly, questions of invisibility include attention to the dynamics shaping the negotiations of and stances toward problem spaces, histories, and aspirations in PDR. Reflecting the need for new kinds of first order *how do* questions touched on above, questions of invisibility also include recognizing and naming the practices, ways of relating, and ways of knowing that have been obscured or devalued by historically powered discourses, such as everyday mathematical activity within families (Booker & Goldman, this issue), the relational work of promotoras within the food justice movement (Jurow et al., this issue), the process of building “politicized trust” within PDR partnerships (Vakil et al., this issue), and the visibility of queer and nonconforming identities among researchers (McWilliams, this issue). Here, critical reflexivity refers to the ways new forms of visibility constitute refusals of the deficit frames that deem particular practices and ways of knowing and being invisible, and create openings for the assertion of alternate values. However, critical reflexivity is not simply a matter of working to see and therefore value what was previously “unseen” from the perspective of power. Understanding the persistence of racialized, gendered, and otherwise exotifying optics that filter the intelligibility of practices of historically nondominant communities through normative epistemologies, we argue that such reflection must also include critical attention to how we see, and how we move differently based on new forms of perception and understanding (Ingold, 2001).

This reflective practice has the potential to deepen understandings of what matters in PDR work, both substantively (as tied to theories of learning) and methodologically (as tied to axiological innovations).

For example, it can help wrestle with the question, “Who engages in design?” by productively troubling liberal constructs of “voice” and “democratic dialogue” within PDR and research–practice partnerships more broadly. Here, the question is not merely “whose voices are represented?,” which can lead to tokenized pathways that may not substantively infuse or alter the work, or to a focus on who is speaking and who is listening at a given moment that can mask underlying dynamics of power. As Zavala (this issue) writes, processes of consensus building and co-design are “not just about hearing different voices and running through seeming democratic processes; what matters is the quality of those discussions and how participants’ voices develop in relation to the expansion of the object.” It is not only the act of co-designing that matters, but the conceptual lenses, forms of relationality and professional vision developed in these processes that allow participants to see and move in new ways. When theory is treated as a shared and heterogeneously derived tool for new forms of reflection and practice, such that forms of theorizing emerging from both inside and outside the university are substantively valued in the work, teachers, families, students, and community members may be recognized as having a privileged standpoint from which to contribute to processes of joint design as well as data analysis and writing. This disposition toward theory can help challenge the paternalism that can emerge within efforts to alter power dynamics by “giving voice” or by relinquishing the responsibility to lead and mediate PDR processes toward equitable forms of dialogue and listening.

Alternate questions that might help engender such role re-mediations include: What are people who have been deeply engaged in distinct dimensions of teaching and learning activity within a given setting (teachers, parents, youth, community organizers, researchers) saying about what matters in the work? What is visible and what is made invisible? To whom? Toward what ends? How can partnerships make persistent erasures visible, felt, open to critique, and actionable? What new forms of listening and mediation does this require? Using these kinds of questions to guide the establishment and ongoing development of new structures within partnerships can also help prepare the grounds for forms of accountability and dissent that allow erasures to be named and potentially addressed rather than treated as business as usual. McWilliams (this issue) provides an example of what it looks like when such questions are used to organize processes of design across researchers and educators. In the context of co-designing a curricular unit on gender diversity at a K-8 school, participants asked themselves: “What experiences with gender and gender norms have we accumulated over our lifetimes, and how are they similar or different? What assumptions do we carry about gender and sexuality, and what helps us to articulate and challenge those assumptions?”

While new forms of visibility can therefore represent important individual and collective shifts, a number of the authors in this special issue (Booker & Goldman; Jurow et al.) argue that visibility alone is often not enough to desettle deficit frameworks and related practices, policies, and dynamics of power. Booker and Goldman conclude that visibility should be treated as a necessary but insufficient goal within PDR. This argument yields a number of implications: when invisibility is challenged during the process of co-design, or when practices and ways of knowing become visible to new stakeholders (or visible in new ways), researchers might productively orient towards these moments as power laden; invisibility is not an innocent oversight but often a historically accumulated manifestation of power. Similarly the act of naming is itself a site of power and contestation that can lead to both the reification of dominant discourses and the reclamation of epistemic authority (Booker & Goldman, this issue). New forms of visibility are also windows into implicit or undervalued dimensions of design work that may provide resources for the development of theories of learning and partnering, as well as occasions when the emergence of tensions, contradictions and dissent may be heightened such that careful listening and mediation may propel new cycles of expansive learning and agency.

For Vakil et al., this includes making visible the ways that racialization, solidarity, and the development of “politicized trust” are consequential to how partnerships develop and unfold. For Zavala, questions of visibility involve treating design as an ongoing and organic activity within grassroots and other settings, rather than an imported property of researchers or “designers” that begins when the partnership is initiated. Understanding the ways local histories of design activity are rendered invisible may call attention to colonial dynamics—whereby “knowledge does not manifest until someone [in a position of power] has discovered it” (Patel, 2016, p. 76)—and illuminate barriers to authentic relational work and trust.

Conversely, efforts to study local genealogies of design (and their underlying values) may help widen the target or subject of learning to include researchers themselves (Bang et al., 2015). This does not mean we can never problematize or critique existing practices; rather, we can assume their presence and seek to understand their theoretical principles, values and histories as a necessary starting point for new forms of joint activity and cycles of design. Recent work on “value mapping” within design-based research (Shea & Ryoo, personal communication) offers a promising tool along these lines. As opposed to beginning with a set of hypotheses, researchers and educators began partnerships by documenting and making explicit the respective values they hold with regards to teaching and learning. The process allowed terms like “educational equity” to be examined and unpacked rather than taken for granted as signifying shared or normative meanings. Such processes can make room for critical perspectives and questions that might remain dormant when partnerships begin without sustained attention to what participants value in the work.

Collectively, the articles in this special issue also suggest that both within PDR and in research on learning more broadly it is often the relational aspects of design and educational activity that are rendered invisible. As Ehret and Hollet’s (this issue) analysis of affect within PDR highlights, when the effort, care, intellectual, and emotional work that goes into seeding and cultivating subject–subject relations is minimized, we run the risk that it will either be less prioritized and resourced within new cycles of work, or that researchers and students new to PDR will engage in such practices but perhaps feel less emboldened to highlight these dimensions in their analyses. These constraints work against our understandings of what is consequential to the work and prevent us from further opening up the question of how collectives or communities learn (Engeström, 1996a)—a shift in perspective and theorizing necessitated by the move toward studying learning in social-change-making projects. Booker and Goldman provide a compelling example of what this shift in perspective might look like when they connect the increased visibility of everyday mathematical expertise to the ways *people* became visible to one another “as both learners and authorities.” As they state: “We saw Blesilda experience a change in agency and authority about math,” a change that “was reflected in the research team’s shift in role from authority to witness.” Such ethical and existential shifts are not only resources for learning; they embody new ways of being and becoming and suggest that our research ought to attend to if and how new subject–subject relations carry forward, in what ways, and toward what ends.

As we transition to a discussion of heterogeneity and transformative agency within PDR, we also believe it is important to complicate the ways we, as a field, may tend to correlate increasing visibility with expanded forms of agency. Jurow et al. (this issue) end their article by raising a cautionary tension: “sometimes work accomplished ‘under the radar’ or on the margins of official practice could be more powerful than it might otherwise be (see Hooks, 1994).” In line with research on “hidden transcripts” (Scott, 1990), dangerous or hidden forms of learning (Espinoza & Vossoughi, 2014; Gundaker, 2007), subversive discourse and embodied practice (Erickson, 2004; Kelley, 1996), we believe it is important to attend to the ways visibility may at times threaten or compromise creative design and pedagogical practices that take shape “under the radar.” As Jurow et al. suggest (this issue), the forms of social change making and learning that are nurtured on the margins or in the borderlands may, at times, afford greater room for self-determined intellectual and relational activity. At the same time, the risks of visibility can include inviting in logics of surveillance (Ali, 2016; Erickson, 1996; Vossoughi & Escudé, 2016) or political repression, particularly amidst the rise of a white supremacist backlash (as witnessed in the banning of Mexican American studies in Arizona; see Phippen, 2015). But even within organizations and partnerships that are organized around shared equity goals, visibility can obligate forms of translation across hierarchies of power and epistemology that shift centers of gravity away from studying valued practices and forms of learning on their own terms. For example, arguments for implementing Ethnic Studies courses at the high school level have benefited from recent research on the causal effects of such courses (Dee & Penner, 2016). At the same time, the argument that Ethnic Studies should be required because it increases student achievement based on normative measures risks discounting a wider set of developmental outcomes that may be deeply valued by students, teachers and families, but overlooked by standard frames of achievement. We suggest that these tensions are not easily resolvable and necessitate expanded forms of politicized trust (Vakil et al., this issue) such that our cycles of design and analysis

become increasingly sensitive to when and how these dynamics emerge. This might also include the shared decision not to report on particular aspects of data (or to wait on *when* to report) out of commitment to protecting subaltern spaces and forms of activity.

Heterogeneity and transformative agency

Persistent erasures of heterogeneity, often through devaluing nondominant ways of knowing and invoking epistemic hierarchies, are routine forms of activity in many contexts and work against transformative possibilities, particularly when these dynamics are saturated with historically powered relations. For example, the construction of inequity and difference in much of educational research can and often does lean toward deficit constructions, the erasure of heterogeneity, and the simplification of complex cultural phenomena by obfuscating structural dimensions and routinely focusing on individualized learners (Gutiérrez & Orellana, 2006). A related issue is the extent to which the problem of inequity is constructed as learners or communities' lack of agency, engagement, effort, or mastery of normative content knowledge or skill sets without, as mentioned previously, consideration of the assimilative assumption and demand that such mastery requires. From this perspective, the articles in this issue (as well as other work in the field) suggest that PDR may be important in desettling normative assumptions and design practices. Accomplishing such desettling will depend on the extent to which the coupling of heterogeneity with transformative agency (Engeström, 2011; Haapasaari, Engeström, & Sannino, 2014; Sannino, 2008, 2015), informed by relational agency (Edwards, 2005, 2007), are engaged as theoretical and analytical lenses towards the expansion of the object.

Drawing from Bakhtin's (1981) notions of heteroglossia, Rosebery, Ogonowski, DiSchino, and Warren (2010) asked the following: "What if, as a field, we worked to construct a different narrative? One that conceptualizes the heterogeneity of human cultural practices as fundamental to learning, not as a problem to be solved but as foundational in conceptualizing learning and in designing learning environments?" (p. 323). A key insight emerging from their work is that when heterogeneity is deeply engaged, a kind of merging or coordination in different ways of seeing (Goodwin, 1994, 2000; Hall & Horn, 2012) emerges and opportunities for learning multiply. We suggest that the coordination and dynamic coexistence of multiple ways of seeing and knowing (Gutiérrez, 2014), or forms of epistemic heterogeneity (Bang, in press), not only increases opportunities to learn but may also be key in cultivating collective forms of transformative agency that sustainably shift historically powered inequities in education. Lee (2008) made a similar call around developing learning environments that are reflective of learners' cultural ecologies in order to fundamentally advance our knowledge of learning and development. She noted that most educational environments in the United States are saturated with normative assumptions reflective of the white middle class that constrain scopes of possibilities.

In our view, deeply responding to these calls requires that as a field we work toward forms of collective transformative agency that attend to the dimensions of relationality—their textures, dynamics, forms, and affective potentials—made possible by expansive engagement with subject–subject and subject–object relations. In part the proposition here is that the expansive forms and configurations of relationships that produce transformative agency and enable new learning and ways of being will necessarily be characterized by engaging heterogeneity. Indeed these may even be seen as kinds of measures with which to assess the efforts in PDR projects, wherein we mean: If and how did processes of partnering and enactments of new learning environments manifest heterogeneity and cultivate transformative agency? And if not, why not? Further, we might begin to ask: Transformative agency for whom and under what contexts? Linked to these questions, Zavala (this issue) asks, how does increased participation allow for the expansion and shifts in the objects of design?

We suggest that PDR may be a productive methodological and theoretical tool in this endeavor because it can afford the deliberate cultivation and focus on the co-constitution of transformative agency and expansive forms of relational agency as an explicit object of analysis. Haapasaari, Engeström, & Kerosuo (2014) argue: "Transformative agency differs from conventional notions of agency in that it stems from encounters with and examinations of disturbances, conflicts, and contradictions in the collective activity. Transformative agency develops the participants' joint activity by explicating and envisioning

new possibilities. Transformative agency goes beyond the individual as it seeks possibilities for collective change efforts” (p. 2). These forms of analysis and imaginings include new commitments and actions, sometimes through speech acts (Sannino, 2008) or what some authors in this issue are calling articulation work (Hall, 1996; Star, 1991; Suchman, 1996). Ehret and Hollet (this issue) take up these issues by focusing on the role of affect in relational achievements of placemaking. They suggest, “As a sense of place forms, capacities for action are augmented. These feelings of action-potential are crucial not only to engagement in learning but also to maintaining social cohesion—a feeling which shapes, reciprocally, action-potential.”

PDR projects may be an especially well suited approach to dwelling with these layers if dynamics of visibility and invisibility are taken up seriously, alongside efforts to understand rather than necessarily solve or reconcile forms of agreement and disagreement (Matusov, 1996). The forms of agreement and disagreement that unfold in PDR projects may better be understood as generative tensions that offer windows into the extent to which PDR projects develop a sense of mutual responsibility (Hicks, 2000) and appropriate, although perhaps contested, relational ethics (Shotter, 1993) and belonging. While forms of agreement often become actionable and reported on in design work, points of dissent, resistance, refusal, and other manifestations of disunity that we suggest are routinely rooted in axiological concerns may need to be more carefully traced in moments of interaction as well as across time. Practically and analytically, it seems that we need to pay close attention to these moments, asking: How do issues of heterogeneity (or its negation) and axiology manifest in these moments? How are they handled collectively? What forms of listening do they require? What understandings ripple out from these moments? Why are they significant within PDR work? Such questions may allow PDR to further develop existing work on the generative potential of tensions and contradictions that are fundamentally connected to issues of heterogeneity, and that enable axiological innovations that may open a space for assembling new ways of working in the future.

The weight of forms of disagreement, tensions, and contradictions and their generative potentials may be connected to where we locate the impetus for change, what historicity is being attended to, and how agency is narrated. For projects that are emergent from communities or grassroots and reflect historically accumulating forms of inequity, efforts and initiatives for change are often not really new nor introduced by interventionists, although activity and analysis are often organized as if this were the case. This tendency may lead to inaccurate accounts of learning phenomena or, worse, colonizing forces that reify normative power dynamics such as who is initiating and who is resisting and why. With the expanded perspective we are arguing for here, moments of dissent and the responses, negotiations and navigations that follow may be key sites in which we can learn more about the challenges to change, authentic forms of democratic dialogue and collective movement. Several articles attend to the forms of dissent, the responses to dissent, and the roles of researchers in some of these interactions in ways rarely reported on. For example, Zavala (this issue) calls particular attention to how disagreement functioned in collectivizing decision making and building consensus. Ehret and Hollet (this issue) explore the ways in which dissent manifests in affective dimensions of relations in interaction. Jurow et al. (this issue) and Vakil et al. (this issue) both articulate the complexity of opening critical and reflective dialogues wherein both partners and researchers are the subjects of reflection. Continuing to explore the nature of disagreements, dissent, and refusals in PDR may be critically important in processes of partnering as they each likely have qualitatively different implications and may occur with particular forms of powered relations. Further we suggest that these disagreements, when further dwelt in, may be tied to heterogeneity and needed expansions of the object. Thus, they may also be a kind of indication of good problems for future design work.

A key issue that we suspect will persist for some time is the extent to which we can develop lenses and analytical approaches to transformative agency that, as Engeström (2014) articulates, are “theoretically substantiated and, preferably, turned into operational conceptual tools for analysis of empirical data” (p. 124). To achieve some progress on these issues, we imagine there will need to be a shift in the narrative reporting of studies such that “outcomes” are troubled, contradictory, and incomplete in the sense they are still always unfolding. Such a shift may also require a broader scope for where outcomes might be seen and a heightened interest in understanding subject–subject relations over time. We anticipate that

making sense of these processes will challenge simplistic constructions of causality such that forms of relational agency (Edwards, 2005, 2007, 2009) and mutual responsibility (Hicks, 2000) become necessary dimensions for collective activity. Edwards (2007) suggests that relational agency is “intended to capture a capacity to align one’s thoughts and actions with those of others to interpret aspects of one’s world and to act on and respond to those interpretations” (p. 4). Bang et al. (2015), drawing from Shotter (2005) and reflecting Bakhtinian dialogicality, suggest that community-based design work requires “witness designing” that positions designing from within the flows of the ongoingness of communities and more specifically the subject–subject relations that constitute them.

As reflected in the pieces in this special issue, engaging in subject–subject relations in PDR not only works to create forms of transformative agency, but it also seems to demand new “how can” questions focused on the ways in which people engaged in PDR (researchers too) experience or feel forms of transformative agency especially when heterogeneity informed by critical historicity is central to joint activity. Increasingly, we may need to attend to what sorts of affective potentials can be created in and through PDR and more specifically through subject–subject relations. Booker and Goldman (this issue) begin down this road through the focus on systemic repair as a mode of agency, and specifically restoring parents’ epistemic authority in mathematics through engaging parent leaders in recognizing and developing expanded mathematical practices and forms of activity. In the description of early efforts in their work, parent workshops did not manifest the kinds of agency they desired nor did they seem to disrupt normative power structures. However, over the course of their work, the dynamics shifted not only between the parents and teachers in their study—but also with the researchers. To accomplish this role re-mediation, the project’s efforts increasingly attended to “personal experiences” and addressed the emotional or affective states (“anxieties in the room”) that were “prevalent but typically unspoken.” Indeed, in the third workshop they describe the role of the parent facilitator:

Blesilda set the tone, gently addressing fears with encouragement and confidence. Parents expressed gratitude to participate in a workshop that did not expose them as not knowing school math (the anxieties and gratitude for not being shamed were frequent occurrences at future workshops hosted in New York, Florida, and Michigan). As the workshop proceeded, parents shared that they felt the activity gave them confidence, that they were doing well, and they realized no one was giving them a test. The difference born of supportive social relationships in the community caught the design team’s collective attention. (Booker & Goldman, this issue)

Here, transformative agency is substantively linked to affective states—how agency is experienced—both for participants and researchers emerging from the “simultaneous positioning of each of us [parents and researchers] as learner and authority in ways of knowing” (Booker & Goldman, this issue). PDR as an approach may help us continue to explore what forms of transformative agency are cultivated and experienced for whom and in what contexts. And we might ask: why is it achieved for some people in a particular context and not others? And how does it “hold together” in and across different places?

In various forms, all of the articles in this issue attend to how role re-mediation as related to shifts in subject–subject relations, both for the researchers and the participants, not only opened up new insights and made new forms of transformative agency possible but also shaped the design lens such that new forms of joint activity could continue to unfold. Forms of PDR that cultivate and hold authentic possibilities for role re-mediation and relational agency may be an important locus for the study and achievement of transformative agency. Further, PDR may also shed light on what new forms of methodological training and professional competencies are needed to meaningfully engage communities, families, practitioners, and powered decision makers, because role-remediation in PDR is not solely the domain of “participants” (Bang et al., 2015). For example, Jurow et al. (this issue) write: “As our relationship with the promotoras has developed, they have also positioned us strategically to share their concerns and advocate for their views with the co-directors and the non-profit’s board of directors. We have willingly embraced these opportunities and played these roles as we view them as an indication of the non-profit’s appreciation for how we can contribute to the organization ...” These forms of role re-mediation themselves reflect disruptions of powered dynamics and potentially afford the rise of new “how do” questions such as: What kinds of structural shifts, and at what scale, need to occur in order for the agentic accomplishments to become routine? Importantly, the answers to these sorts of questions

may have implications for the ways in which scaling or expanding, both spatially and temporally, are conceptualized.

Sustainability, longevity, and life course of the intervention

The role of expanding, sometimes called scaling, and sustaining change is often a central desire and persistent challenge to social change making. If indeed cultivating forms of social change making serves as a primary object of PDR projects, then an important question to ask is to what extent can forms of PDR contribute to sustainable change and how would we know that these forms of change were happening (Fishman et al., 2013; Gutiérrez & Penuel, 2014; Penuel et al., 2011; Penuel, Allen, Coburn, & Farrell, 2015; Svihla, 2014)? In effect, we are asking how would we know if our PDR work was contributing to cultural change and to learning things that are not currently known? Zavala (this issue) argues that “the problem of scaling-up identified by learning scientists is re-framed within a community-organizing context as a problem of reinvention, where ‘repetitions’ of practices in other spaces embody developmentally new activity.” A potential contribution PDR makes toward understanding problems of scale and efforts toward cultural change is the opportunity to better understand how individuals who experience transformative agency and change come to intervene and impact new spaces and sets of relations at particular scales of time. This view of change and scale is a human populated view of change as distinct from a policy-enacted view of change (Moses, Kamii, Swap, & Howard, 1989). Zavala (this issue) suggests that Association of Raza Educators (ARE) members became the “primary carriers” of the renewed culture developed in the context of their work, with the knowledge generated forming an ever-expanding toolkit of organizing resources, bringing new possibilities to future endeavors. These insights raise the possibility that PDR projects may help to unearth new theories and strategies of change by reconceptualizing the often settled subject–object relations and assumptions within constructs of scale and transferability, toward engaging expanded forms of subject–subject relations and their co-constituted subject–object relations.

In an era in which scaleability has become a routine question and desire but has largely failed to bring about espoused outcomes, it seems warranted that as a field we carefully re-examine the assumptions that drive such efforts. Erickson (2014) argues that many of our scaling efforts in education are fundamentally flawed because they presume faulty ideas about human life, time, and what is practicable. He argued that the paradigms of “scaling up,” “best practices,” and “high fidelity implementation” that are currently at play will continue to fail because they “require the future that it not be original; that it holds still” (p. 3) and that what works in one time and place will hold true in other times and places. We concur and suggest that in part these failures stem from a focus on the dehistoricized scaling of subject–object relations with little attention to process in specific places. Often scaling efforts are generated by predictive logics of control that ultimately sustain the status quo, as distinct from expansive processes driven by proleptic commitments and sensibilities predicated on always evolving and reconstructed subject–subject relations.

Indeed, Erickson invites us to consider low fidelity implementations as possibly a better course. He suggests this approach involves celebrating local adaptations and policies that provide for “custom tailoring or practices to fit the particularity of local circumstance” or what we might see as a policy that values heterogeneity of practices and cultivates the transformative agency of local places. In addition, we look to the methodological developments of third generation activity theory to glean tools for studying cultural change rather than designing for scale. Vossoughi and Gutierrez (2014) question ahistorical views of “scale” and “transfer,” arguing that a phenomenon should be examined across a minimum of two activity systems (Engeström, 2005) and that a “multi-sited ethnographic sensibility” (Marcus, 1995) undergirds the methodological imperative of understanding learning as “movement” within and across activity systems (p. 604). The articles in this issue offer a number of potential insights and challenges to issues of movement and sustainability, and make steps toward rethinking how the life course of interventions might be conceptualized.

All of the authors in this issue, to varying degrees, focus on processes of partnering and the forms of subject–subject relations developed in PDR projects. Importantly, across the set of articles there were

unexpected and unplanned turns in the relations and the objects of study that were followed, resourced, and focused on, often toward expanding shared sensibilities, affective states, and more specific forms of consequentiality. Within PDR, then, “scaling method” might be seen as a way to privilege and argue for the kinds of practices and relations that matter in the work, whereas scaling activities or products can often result in the stripping away of the relations, ethics, and sensibilities that guided the work. This could be key because what is often stripped away in growth efforts is the depth of historicity reflected in the relations and heterogeneity that was achieved in the original work. Jurow et al. (this issue) attend to the emergence of tensions that can, and as they suggest, likely should arise when new tools are introduced into a complex cultural and historical activity system that includes racialized, gendered, classed, and linguistic dynamics of power. One implication from their work is that the point at which tools, products, and methods are scaled might be critical moments that call for heightened sensitivity to the possible replication rather than transformation of historically powered relations.

Indeed the distinction between scaling products and methods is important especially in the context of PDR projects. Booker and Goldman (this issue) suggest the most persistent pressures they felt were “associated with bringing products of design, such as workshops, to scale—*rather than methods*” (emphasis in original). They conclude that “open-ended social innovations” are crucial to systemic repair and that scaling processes rather than products is a challenge for which PDR is well matched. Further, PDR may help to document and assert the critical importance of the relations and histories that made change possible during efforts to share or expand localized innovations to new activity systems in ways previous efforts have often failed to do. Vakil et al. (this issue) delve into the ways that research has already been a part of ongoing change or relational replications in many nondominant communities: “As a research team, we were mindful of the history of research on African American communities, where community members were critical of researchers coming in and taking from them—taking data, taking people’s ideas, getting the story only partially right—and building careers on the backs of people who never see any benefit from the research.” Booker and Goldman (this issue) offer a related insight, “our research ought to attend to if and how new subject–subject relations carry forward, in what ways and toward what ends.” Questions of sustainability in such efforts often emerge from the presumption that interventions are imposed from the outside. PDR projects that accomplish role re-mediations and expansive forms of understanding do so, we suggest, because they emerge from ongoing developments of life. What seems important to ask is what kinds of structural shifts might be needed to support such forms of PDR work? For example, are there shifts in institutional processes such as institutional review board (IRB) review? Or in the publishing norms of the academy? Or in the ways in which funding is structured? Such questions will continue to need to be asked and interrogated, or transformative social change could be impeded.

The pace and process of transformative social change has been a topic of interest in many fields, particularly those that involve deep social relations and critiques of power (e.g., Fanon, 1965; Gramsci, 1972; Smith, 1999). Booker and Goldman (this issue) highlight that there can be a slow road to incremental change in which both positive or transformative steps are made even when or if aspects of larger systemic problems are in place. In PDR, we suggest the question of transformative social change is emergent and tied to what feels relevant and possible given the historicity and goals of the intervention, and its axiological stances, in locally specific ways. Such local innovations in activity and relationality may potentially contribute to and open up new visions for macro changes, but may not be synonymous with them. Not only does this decoupling open space for new forms of possible futures to continue to grow in locally specific ways, it also resists suggesting that a singular project’s efforts failed without such transformations. Additionally, we suggest that unsuccessful efforts can be signs of robust learning. The pervasive tendency to not report “unsuccessful” outcomes has created a skewed view of inquiry in a range of fields. PDR projects can create the conditions (although it is not automatic) for a kind of responsible relational ethic to emerge that expands what needs to be attended to, learned, or hypothesized about to explore different approaches to systematic repair (Booker & Goldman, this issue). Minimizing the accomplishments in PDR work in which local actors experience and achieve forms of agency or invest efforts replicates the problems Erickson (2014) highlighted. Indeed, with more attention to the obstacles and barriers to sustainable change, we might gain better insights for future cycles of design.

These issues also raise questions about the pace and contextual time of change efforts we think we are enacting. Martin (2009) characterizes our current climate as “a solution on demand environment” wherein the scale of problems we are taking on are minimized and project efforts are held to inappropriate expectations such that a singular project should be able to produce revolutionary impacts (e.g., all students excelling academically). Indeed, we see some of the articles in this issue reflecting a sense that deliberate change is laborious and involves the patient layering of practices and long term visioning within the focal activity system and the lifecourse of collective learning. Zavala (this issue) is careful to warn that the rhythms of change within relational work are not to be confused with the bureaucratization that characterizes institutional decision making, as the work in relationships is about the ethical co-development of people with new forms of agency. In part we see Zavala pointing to the routine emergence of problematic constructions of practicability as they intersect with scaling efforts, often through discourses of impact and incremental change that enclose more radical agendas of transformative social change. Thus, discussions of scale should by design include explicit conversations about the tensions between reformist and transformative agendas, keeping open both the possibility of generative tensions with practicability and incremental change and holding transformative agendas accountable to consequential action in the here-and-now.

A final question that the articles in this issue raise for us: How do we see and engage with endogenous design processes? There seems to be a broad and subtle assumption in the fields of design and intervention work that designing and intervention is not a routine human activity and is introduced from the outside. We are inclined to think that design and intervention are endogenous to human activity. This stance suggests there is much work to be done in studying these processes in routine parts of life across a wide range of contexts. However, from our perspective the focus on studying learning in explicit social change-making projects readily affords us opportunities to study participatory design processes that emerge in everyday life—a form of new “how do” questions. Further, we suggest that such work may enable whole new forms of “how can” questions to be asked through participatory design methods precisely because PDR works toward joint activity *across* researchers and communities, rather than being led by one or the other.

References

- Ali, A. I. (2016). Citizens under suspicion: Responsive research with community under surveillance. *Anthropology & Education Quarterly*, 47(1), 78–95.
- Bakhtin, M. M. (1981). *The dialogic imagination: Four essays* (M. Holquist, Ed.; C. Emerson & M. Holquist, Trans.). Austin, TX: University of Texas Press.
- Bang, M. (in press). Epistemic heterogeneity and field STEM: Possibilities for equity and change. *Science Education*.
- Bang, M., Faber, L., Gurneau, J., Marin, A., & Soto, C. (2016). Community-based design research: learning across generations and strategic transformations of institutional relations toward axiological innovations. *Mind, Culture, and Activity*, 23(1), 1–14.
- Bang, M., & Marin, A. (2015). Nature–culture constructs in science learning: Human/non/human agency and intentionality. *Journal of Research in Science Teaching*, 52(4), 530–544.
- Bang, M., & Medin, D. (2010). Cultural processes in science education: Supporting the navigation of multiple epistemologies. *Science Education*, 94(6), 1008–1026.
- Bang, M., Medin, D., Washinawatok, K., & Chapman, S. (2010). Innovations in culturally based science education through partnerships and community. In M. Khine and I. Selah (Eds.), *New science of learning: Cognition, Computers and Collaboration in Education* (pp. 569–592). New York, NY: Springer.
- Bell, P. (2004). On the theoretical breadth of design-based research in education. *Educational Psychologist*, 39(4), 243–253.
- Booker, A. N., Vossoughi, S., & Hooper, P. K. (2014). *Tensions and possibilities for political work in the learning sciences*. In Proceedings of the International Conference of the Learning Sciences, Boulder, CO.
- Booker, A., & Goldman S. (2016). Participatory design research as a practice for systemic repair: Doing hand-in-hand math research with families. *Cognition & Instruction*, 34(3).
- Brown, A. L. (1992). Design experiments: Theoretical and methodological challenges in creating complex interventions in classroom settings. *The Journal of the Learning Sciences*, 2(2), 141–178.
- Cammarota, J., & Fine, M. (2008). Youth participatory action research. In M. Fine & J. Cammarota (Eds.), *Revolutionizing Education: Youth Participatory Action Research in Motion* (pp. 1–12). New York, NY: Routledge.
- Cobb, P., Confrey, J., diSessa, A., Lehrer, R., & Schauble, L. (2003). Design experiments in educational research. *Educational Researcher*, 32(1), 9–13.

- Coburn, C. E., Penuel, W. R., & Geil, K. E. (2013). *Research-practice partnerships: A strategy for leveraging research for educational improvement in school districts*. New York, NY: William T. Grant Foundation.
- Cole, M. (1996). *Cultural psychology: A once and future discipline*. Cambridge, MA: Harvard University Press.
- Cole, M. (2007). Sustaining model systems of educational activity: Designing for the long haul. In J. Campione, K. Metz & A. S. Palinscar (Eds.), *Children's learning in and out of school: Essays in honor of Ann Brown* (pp. 71–89). New York, NY: Taylor & Francis.
- Cole, M., & Griffin, P. (1983). A socio-historical approach to re-mediation. *The Quarterly Newsletter of the Laboratory Comparative Human Cognition*, 5(4), 69–74.
- Dee, T., & Penner, E. (2016). The causal effects of cultural relevance: evidence from an ethnic studies curriculum. *National Bureau of Economic Research*.
- Edwards, A. (2005). Relational agency: Learning to be a resourceful practitioner. *International Journal of Educational Research*, 43(3), 168–182.
- Edwards, A. (2007). Relational agency in professional practice: A CHAT analysis. *Actio: An International Journal of Human Activity Theory*, 1, 1–17.
- Edwards, A. (2009). Agency and Activity Theory: From the systemic to the relational. In A. Sannino, H. Daniels, and K. Gutierrez (Eds.), *Learning and Expanding with Activity Theory* (pp. 197–211). Cambridge, MA: Cambridge University Press.
- Engeström, Y. (1987). *Learning by expanding: An activity-theoretic approach to developmental research*. Helsinki, Finland: Orienta-Konsultit.
- Engeström, Y. (1996a). Developmental work research as educational research. *Nordisk Pedagogik: Journal of Nordic Educational Research*, 16(5), 131–143.
- Engeström, Y. (1996b). Development as breaking away and opening up: A challenge to Vygotsky. *Swiss Journal of Psychology*, 55, 126–132.
- Engeström, Y. (2011). From design experiments to formative interventions. *Theory & Psychology*, 21(5), 598–628.
- Engeström, Y., Engeström, R., & Kerosuo, H. (2003). The discursive construction of collaborative care. *Applied Linguistics*, 24(3), 286–315.
- Engeström, Y., & Sannino, A. (2010). Studies of expansive learning: Foundations, findings and future challenges. *Educational research review*, 5(1), 1–24.
- Engeström, Y., Sannino, A., & Virkkunen, J. (2014). On the methodological demands of formative interventions. *Mind, Culture, and Activity*, 21(2), 118–128.
- Erickson, F. (1984). What makes school ethnography “ethnographic”? *Anthropology & Education Quarterly*, 15(1), 51–66.
- Erickson, F. (1994). Where the action is: On collaborative action research in education. *Bulletin of the Council for Research in Music Education*, 10–25.
- Erickson, F. (1996). On the evolution of qualitative approaches in educational research: From Adam’s task to Eve’s. *The Australian Educational Researcher*, 23(2), 1–15.
- Erickson, F. (2004). *Talk and social theory: Ecologies of speaking and listening in everyday life*, No. 123. Cambridge, UK: Polity Press.
- Erickson, F. (2006). Studying side by side: Collaborative action ethnography in educational research. In G. Spindler & L. Hammond (Eds.), *Innovations in educational ethnography: Theory, methods and results* (pp. 235–257). Mahwah, NJ: Lawrence Erlbaum.
- Erickson, F. (2014). Scaling down: A modest proposal for practice-based policy research in teaching. *Education Policy Analysis Archives*, 22(1–9), 1–9.
- Espinoza, M. L. (2008). *Humanization and social dreaming: A case study of changing social relations in a summer migrant educational program*. (Doctoral dissertation), UCLA, Los Angeles, CA.
- Espinoza, M. L. (2009). A case study of the production of educational sanctuary in one migrant classroom. *Pedagogies: An International Journal*, 4(1), 44–62.
- Espinoza, M. L., & Vossoughi, S. (2014). Perceiving learning anew: Social interaction, dignity, and educational rights. *Harvard Educational Review*, 84(3), 285–313.
- Faber, L. (2016). Rethinking research: Learning opportunities within a Native American urban context. *Journal of American Indian Education*, 55(1).
- Fanon, F. (1965). *A dying colonialism*. New York, NY: Grove Press.
- Fine, M., Torre, M. E., Boudin, K., Bowen, I., Clark, J., Hylton, D.Upegui, D. (2003). Participatory action research: From within and beyond prison bars. In P. M. Camic, J. E. Rhodes, & L. Yardley (Eds.), *Qualitative research in psychology: Expanding perspectives in methodology and design* (pp. 173–198). Washington, DC: American Psychological Association.
- Fishman, B., Konstantopoulos, S., Kubitskey, B. W., Vath, R., Park, G., Johnson, H., & Edelson, D. C. (2013). Comparing the impact of online and face-to-face professional development in the context of curriculum implementation. *Journal of Teacher Education*, 64(5), 426–438. doi:10.1177/0022487113494413
- Giddens, A. (1984). *The constitution of society: Outline of the theory of structuration*. Berkeley and Los Angeles, CA: University of California Press.
- Goodwin, C. (1994). Professional vision. *American Anthropologist*, 96(3), 606–633.
- Goodwin, C. (2000). Action and embodiment within situated human interaction. *Journal of Pragmatics*, 32(10), 1489–1522.

- Gramsci, A. (1972). *L'Alternativa Pedagogica [The Pedagogical Alternative]*. Edited by MA Manacorda. Florence, Italy: La Nuova Italia.
- Gundaker, G. (2007). Hidden education among African Americans during slavery. *The Teachers College Record*, 109(7), 1591–1612.
- Gutiérrez, K. D. (2008). Developing a sociocritical literacy in the third space. *Reading Research Quarterly*, 43(2), 148–164.
- Gutiérrez, K. (2013). Foreword. In K. Hall, T. Cremin, B. Comber, & L. Moll (Eds.), *International handbook of research on children's literacy, learning, and culture* (pp. 29–36). New York, NY: Wiley-Blackwell.
- Gutiérrez, K. (2014). Integrative research review: Syncretic approaches to literacy learning. Leveraging horizontal knowledge and expertise. In P. Dunston, L. Gambrell, K. Hadley, S. Fullerton, & P. Stecker (Eds.), *63rd literacy research association yearbook* (pp. 48–61). Altamonte Springs, FL: Literacy Research Association.
- Gutiérrez, K. D., Baquedano-López, P., & Tejada, C. (1999). Rethinking diversity: Hybridity and hybrid language practices in the third space. *Mind, Culture, and Activity*, 6(4), 286–303.
- Gutiérrez, K. D., Morales, P. Z., & Martinez, D. C. (2009). Re-mediating literacy: culture, difference, and learning for students from nondominant communities. *Review of Research in Education*, 33, 213–245.
- Gutiérrez, K. D., & Orellana, M. F. (2006). At last: The “problem” of English learners: Constructing genres of difference. *Research in the Teaching of English*, 40(4), 502–507.
- Gutiérrez, K., & Penuel, W. R. (2014). Relevance to practice as a criterion for rigor. *Educational Researcher*, 43(1), 19–23.
- Gutiérrez, K., & Vossoughi, S. (2010). “Lifting off the ground to return anew”: Documenting and designing for equity and transformation through social design experiments. *Journal of Teacher Education*, 61(1–2), 100–117.
- Hall, S. (1996). Race, articulation, and societies structured in dominance (Papers). *Sociological theories: Race and colonialism*. Paris, France: UNESCO.
- Hall, R., & Horn, I. (2012). Talk and conceptual change at work: Adequate representation and epistemic stance in a comparative analysis of statistical consulting and teacher workgroups. *Mind, Culture, and Activity*, 19(3), 240–258.
- Hall, R., & Jurow, A. S. (2015). Changing concepts in activity: Descriptive and design studies of consequential learning in conceptual practices. *Educational Psychologist*, 50(3), 173–189.
- Haapasari, A., Engeström, Y., & Kerosuo, H. (2014). The emergence of learners' transformative agency in a Change Laboratory intervention. *Journal of Education and Work*, 29(2), 1–31.
- Hicks, D. (2000). Self and other in Bakhtin's early philosophical essays: Prelude to prose consciousness. *Mind, Culture, and Activity*, 7(3), 227–242.
- Holland, D., & Lave, J. (2001). History in person. *Enduring Struggles: Contentious practice, intimate identities*, 1–32.
- Holland, D., & Leander, K. (2004). Ethnographic studies of positioning and subjectivity: An introduction. *Ethos*, 32(2), 127–139.
- Hooks, B. (1994). *Teaching to transgress: Education as the practice of freedom*. London, UK: Routledge.
- Ingold, T. (2000). *The perception of the environment: Essays on livelihood, dwelling and skill*. New York, NY: Routledge.
- Ingold, T. (2001). From the transmission of representations to the education of attention. In H. Whitehouse (Ed.), *The debated mind: Evolutionary psychology versus ethnography* (pp. 113–153). New York, NY: Berg.
- Kelley, R. (1996). *Race rebels: Culture, politics, and the black working class*. New York, NY: The Free Press.
- Kirshner, B. (2010). Productive tensions in youth participatory action research. *Yearbook of the National Society for the Study of Education*, 109(1), 238–251.
- Lee, C. D. (2001). Is October Brown Chinese? A cultural modeling activity system for underachieving students. *American Educational Research Journal*, 38(1), 97–141.
- Lee, C. D. (2008). The centrality of culture to the scientific study of learning and development: How an ecological framework in education research facilitates civic responsibility. *Educational Researcher*, 37(5), 267.
- Lemke, J. (2002). Ideology, intertextuality, and the communication of science. In P. H. Fries, M. Cummings, D. Lockwood, & W. Spruiell (Eds.), *Relations and functions within and around language* (pp. 32–55). New York, NY: Continuum.
- Marcus, G. E. (1995). Ethnography in/of the world system: The emergence of multi-sited ethnography. *Annual Review of Anthropology*, 24, 95–117.
- Martin, D. B. (2009). Researching race in mathematics education. *The Teachers College Record*, 111(2), 295–338.
- Matusov, E. (1996). Intersubjectivity without agreement. *Mind, Culture, and Activity*, 3(1), 25–45.
- Matusov, E. (1998). When solo activity is not privileged: Participation and internalization models of development. *Human Development*, 41(5–6), 326–349.
- Medin, D. L., & Bang, M. (2014). *Who's asking?: Native science, western science, and science education*. Cambridge, MA: MIT Press.
- Mirra, N., Garcia, A., & Morrell, E. (2015). *Doing youth participatory action research: Transforming inquiry with researchers, educators, and students*. New York, NY: Routledge.
- Moll, L. C. (2010). Mobilizing culture, language, and educational practices fulfilling the promises of Mendez and Brown. *Educational Researcher*, 39(6), 451–460.
- Moses, R., Kamii, M., Swap, S. M., & Howard, J. (1989). The algebra project: Organizing in the spirit of Ella. *Harvard Educational Review*, 59(4), 423–444.
- Nasir, N. S. (2000). “Points ain't everything”: Emergent goals and average and percent understandings in the play of basketball among African American students. *Anthropology & Education Quarterly*, 31, 283–305.

- Nasir, N. (2002). Identity, goals, and learning: Mathematics in cultural practice. *Mathematical Thinking and Learning*, 4, 213–247.
- Nasir, N., & Hand, V. (2006). Exploring sociocultural perspectives on race, culture, and learning. *Review of Educational Research*, 76, 449–475.
- Nasir, N., Rosebery, A. S., Warren, B., & Lee, C. D. (2006). Learning as a cultural process: Achieving equity through diversity. In K. Sawyer (Ed.), *Handbook of the learning sciences* (pp. 489–504). Cambridge, UK: Cambridge University Press.
- Packer, M. (2010). *The science of qualitative research*. Cambridge, MA: Cambridge University Press.
- Paris, D., & Winn, M. T. (2013). *Humanizing research: Decolonizing qualitative inquiry with youth and communities*. Thousand Oaks, CA: Sage.
- Patel, L. (2016). *Decolonizing Educational Research: From Ownership to Answerability*. New York, NY: Routledge.
- Penuel, W. R., Fishman, B. J., Cheng, B. H., & Sabelli, N. (2011). Organizing research and development at the intersection of learning, implementation, and design. *Educational Researcher*, 40(7), 331–337.
- Penuel, W. R., Coburn, C. E., & Gallagher, D. J. (2013). Negotiating problems of practice in research–practice design partnerships. *National Society for the Study of Education Yearbook*, 112(2), 237–255.
- Penuel, W. R., Allen, A. R., Coburn, C. E., & Farrell, C. (2015). Conceptualizing research–practice partnerships as joint work at boundaries. *Journal of Education for Students Placed at Risk (JESPAR)*, 20(1–2), 182–197.
- Philip, T. M., & Azevedo, F. S. (in press). Everyday science learning and equity: Mapping the contested terrain. *Science Education*.
- Phippen, J. W. (2015, July 19). How one law banning ethnic studies led to its rise. *The Atlantic*. Retrieved from <http://www.theatlantic.com/education/archive/2015/07/how-one-law-banning-ethnic-studies-led-to-rise/398885/>.
- Richardson, T. (2011). Navigating the problem of inclusion as enclosure in native culture-based education: Theorizing shadow curriculum. *Curriculum Inquiry*, 41(3), 332–349.
- Rosebery, A. S., Ogonowski, M., DiSchino, M., & Warren, B. (2010). “The coat traps all your body heat”: Heterogeneity as fundamental to learning. *Journal of the Learning Sciences*, 19(3), 322–357.
- Rosebery, A., & Warren, B. (Eds.). (2008). *Teaching science to English language learners*. Arlington, VA: National Science Teachers Association Press.
- Sandoval, W. A., & Bell, P. (2004). Design-based research methods for studying learning in context: Introduction. *Educational Psychologist*, 39(4), 199–201.
- Sannino, A. (2008). From talk to action: Experiencing interlocation in developmental interventions. *Mind, Culture, and Activity*, 15(3), 234–257.
- Sannino, A. (2011). Activity theory as an activist and interventionist theory. *Theory & Psychology*, 21(5), 571–597.
- Sannino, A. (2015). The principle of double stimulation: A path to volitional action. *Learning, Culture and Social Interaction*, 6, 1–15.
- Scott, J. C. (1990). *Domination and the arts of resistance: Hidden transcripts*. New Haven, CT: Yale University Press.
- Shea, M., & Ryoo, J. (2015). Personal communication. See also http://researchandpractice.org/wp-content/uploads/2015/11/Value-Mapping_Nov2015.pdf.
- Shotter, J. (1993). *Conversational realities: Constructing life through language* (vol. 11). Thousand Oaks, CA: Sage.
- Shotter, J. (2005). Goethe and the refiguring of intellectual inquiry: From “aboutness”-thinking to “withness”-thinking in everyday life. *Janus Head*, 8(1), 132–158.
- Smith, L. T. (1999). *Decolonizing methodologies: Research and indigenous peoples*. Zed Books.
- Smith, G. H. (2004). Mai i te maramatanga, ki te putanga mai o te tahiritanga: From conscientization to transformation. *Educational Perspectives*, 37(1), 46–52.
- Star, S. L. (1991). The sociology of the invisible: The primacy of work in the writings of Anselm Strauss. In D. Maines (Ed.), *Social Organization and Social Process: Essays in Honor of Anselm Strauss* (pp. 265–283), New York, NY: Aldine de Gruyter Hawthorne.
- Suchman, L. (1996). Supporting articulation work. In R. Kling (Ed.), *Computerization and controversy: Value conflicts and social choices* (pp. 407–423). San Francisco, CA: Morgan Kaufman.
- Svihla, V. (2014). Advances in design-based research. *Frontline Learning Research*, 2(4), 35–45.
- Talero, M. L. (2008). The experiential workspace and the limits of empirical investigation. *International Journal of Philosophical Studies*, 16, 453–472.
- Tejeda, C. (2008). Dancing with the dilemmas of a decolonizing pedagogy. *Radical History Review*, 102, 27–31.
- Vakil, S., de Royston, M. M., Nasir, N., & Kirshner, B. (2016). Rethinking race and power in design-based research: Reflections from the field. *Cognition & Instruction*, 34(3).
- Vossoughi, S., & Escudé, M. (2016). What does the camera communicate? An inquiry into the politics and possibilities of video research on learning. *Anthropology & Education Quarterly*, 47(1), 42–58.
- Vossoughi, S., & Gutiérrez, K. (2014). Studying movement, hybridity, and change: Toward a multi-sited sensibility for research on learning across contexts and borders. *National Society for the Study of Education*, 113(2), 603–632.
- Vossoughi, S. (2014). Social analytic artifacts made concrete: A study of learning and political education. *Mind, Culture, and Activity*, 21(4), 353–373.
- Vygotsky, L. S. (1978). Mind in society (M. Cole, V. John-Steiner, S. Scribner, & E. Souberman, Eds.).
- Warren, B., Ballenger, C., Ogonowski, M., Rosebery, A. S., & Hudicourt-Barnes, J. (2001). Rethinking diversity in learning science: The logic of everyday sense-making. *Journal of Research in Science Teaching*, 38, 529–552.

- Warren, B., & Rosebery, A. (2011). Navigating interculturality: African American male students and the science classroom. *Journal of African American Males in Education, 2*, 98–115.
- Whyte, W. F. E. (1991). *Participatory action research*. Thousand Oaks, CA: Sage Publications, Inc.
- Wortham, S. (2004). The interdependence of social identification and learning. *American Educational Research Journal, 41*(3), 715–750.
- Wortham, S. (2006). *Learning identity: The joint emergence of social identification and academic learning*. Cambridge, MA: Cambridge University Press.
- Yates, L. (2015). Rethinking prefiguration: Alternatives, micropolitics and goals in social movements. *Social Movement Studies, 14*(1), 1–21.
- Zavala, M. (2013). What do we mean by decolonizing research strategies? Lessons from decolonizing, Indigenous research projects in New Zealand and Latin America. *Decolonization: Indigeneity, Education & Society, 2*(1), 55–71.
- Zavala, M. (2016). Design, participation, and social change: What design in grassroots spaces can teach learning scientists. *Cognition & Instruction, 34*(3).